53. (New) The transgenic mouse of claim 52, wherein said recombination between said two FLP recognition sequences is detected by activation of a gene, wherein said gene produces a detectable product only when in recombined form.

54. (New) The transgenic mouse of claim 53, wherein said gene is expressed from a ubiquitous promoter in said at least one cell expressing a sufficient level of said Flp transgene.

55. (New) The transgenic mouse of claim 53, wherein said detectable product is a histochemical marker encoded by said gene selected from the group consisting of alkaline phosphatase, β -galactosidase, chloramphenicol acetyltransferase, luciferase, green fluorescent protein and β -glucuronidase.

56. (New) The transgenic mouse of claim 53, wherein said detectable product is a transcript expressed from said gene in recombined form that is detectable by *in situ* hybridization.

57. (New) The transgenic mouse of claim 53, wherein said detectable product is a peptide tag encoded by said gene that is detectable by binding to a cognate binder.

58. (New) The transgenic mouse of claim 57, wherein said peptide tag and cognate binder pair are selected from the group consisting of avidin-biotin, GST-glutathione, polyHis-divalent metal, MBP-maltose, 9E10 Myc epitope-antibody, protein A/G-immunoglobulin and SV40 T antigen-antibody.

59. (New) A method of mapping the developmental fate of a cell *in vivo* comprising:

(a) providing a transgenic mouse comprising a genome which contains a Flp transgene under control of a tissue-specific or developmental stage specific promoter and at least two FLP recognition sequences in direct orientation;
(b) expressing the Flp transgene at a level sufficient to catalyze site-specific recombination between said FLP recognition sequences in at least one cell; and
(c) detecting said recombination in said at least one cell, wherein said recombination is evidence of expression of said Flp transgene in said cell or a developmental precursor to said cell.

60. (New) The method of claim 59, wherein said recombination between said two FLP recognition sequences is detected by activation of a gene, wherein said gene produces a detectable product only when in recombined form.

61. (New) The method of claim 60, wherein said gene is expressed from a ubiquitous promoter in said at least one cell expressing a sufficient level of said Flp transgene.

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62. (New) The method of claim 60, wherein said detectable product is a histochemical marker encoded by said gene selected from the group consisting of alkaline phosphatase, β-galactosidase, chloramphenicol acetyltransferase, luciferase, green fluorescent protein and β-glucuronidase.

63. (New) The method of claim 60, wherein said detectable product is a transcript expressed from said gene in recombined form that is detectable by *in situ* hybridization.

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64. (New) The method of claim 60, wherein said detectable product is a peptide tag encoded by said gene that is detectable by binding to a cognate binder.

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65. (New) The method of claim 64, wherein said peptide tag and cognate binder pair are selected from the group consisting of avidin-biotin, GST-glutathione, polyHis-divalent metal, MBP-maltose, 9E10 Myc epitope-antibody, protein A/G-immunoglobulin and SV40 T antigen-antibody.